AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

1-85. (Canceled)

86. (Currently amended) A method of providing therapy to a patient, comprising:

sensing a condition associated with a sleep-wake status of a patient;

detecting the sleep-wake status based on the sensed condition;

sensing pectoral muscle tone using a sensor disposed on a cardiac rhythm management device implanted in a pectoral region;

detecting REM sleep status based on the pectoral muscle tone;

classifying one or more sleep states based on the sleep-wake status and the REM sleep status, wherein the classifying, the detecting the sleep-wake status, and the detecting REM sleep status are [[is]] performed at least in part implantably; and

providing sleep state informed therapy to the patient using the sleep state classification.

87. (Previously presented) The method of claim 86, wherein sensing the muscle tone includes sensing the muscle tone using an electromyogram sensor.

88. (Previously presented) The method of claim 86, wherein sensing the muscle tone includes sensing the muscle tone using a sensor on a header of the cardiac rhythm management device.

89. (Previously presented) The method of claim 86, wherein the sleep state informed therapy comprises a cardiac therapy.

90. (Withdrawn) The method of claim 86, wherein the sleep state informed therapy comprises a preventative therapy.

91. (Previously presented) The method of claim 86, wherein the condition associated with the sleep-wake status of the patient comprises patient activity.

92. (Previously presented) The method of claim 86, wherein sensing the condition associated with the sleep-wake status includes detecting patient activity using an accelerometer.

93. (Previously presented) The method of claim 86, wherein sensing the condition associated with the sleep-wake status includes detecting body posture.

94. (Canceled)

95. (Previously presented) The method of claim 86, wherein the condition associated with the sleep-wake status includes a patient activity signal, and wherein classifying includes determining sleep onset by comparing the patient activity signal to a sleep threshold.

96. (Previously presented) The method of claim 95, wherein classifying also includes determining sleep offset by comparing the patient activity signal to the sleep threshold.

97. (Previously presented) The method of claim 86, wherein classifying includes determining REM sleep onset by comparing the pectoral muscle tone to an REM sleep threshold.

98. (Previously presented) The method of claim 97, wherein classifying also includes determining REM sleep offset by comparing the pectoral muscle tone to the REM sleep threshold.

99. (Previously presented) The method of claim 86, further comprising:

detecting a cardiac signal;

wherein the sleep state informed therapy includes bradycardia pacing therapy responsive to the detected cardiac signal and adapted to switch to a lower pacing rate based on the sleep state classification.

100. (Withdrawn) The method of claim 86, further comprising:

detecting a cardiac signal;

wherein the sleep state informed therapy includes preventative arrhythmia therapy responsive to the detected cardiac signal and to the sleep state classification.

101. (Previously presented) The method of claim 86, further comprising:

detecting a cardiac signal;

analyzing the cardiac signal on a beat-to-beat basis;

wherein the sleep state informed therapy is responsive to the beat-to-beat cardiac signal analysis.

102. (Previously presented) The method of claim 86, further comprising:

detecting a tidal volume of the patient's respiration; and

declaring a hypopnea event if the tidal volume falls below a hypopnea threshold.

103. (Previously presented) The method of claim 102, further comprising:

declaring an apnea event if the tidal volume falls below an apnea threshold lower than the hypopnea threshold.

104. (Currently amended) An implantable cardiac rhythm management device ~~suitable for implantation into~~ configured to be implanted in a pectoral region of a patient, the device comprising:

a detector system comprising a first and second sensor,

the first sensor disposed on the implantable cardiac rhythm management device, the first sensor configured to sense muscle tone in [[a]] the pectoral region of the patient and to detect REM sleep status based on the pectoral muscle tone, and

the second sensor configured to detect sleep-wake status of the patient;

a classification system coupled to the detector system and configured to classify sleep state based on the REM sleep status and the sleep-wake status; and

a therapy system coupled to the classification system and configured to provide cardiac therapy to the patient based on the sleep state classification.

105. (Previously presented) The device of claim 104, wherein the first sensor is an electromyogram sensor.

106. (Previously presented) The device of claim 104, wherein the cardiac rhythm management device comprises:

a housing adapted for implantation in the pectoral region of the patient;

wherein the first sensor is mechanically coupled to the housing.

107. (Previously presented) The device of claim 106, wherein the classification system is disposed within the housing.

108. (Withdrawn) The device of claim 106, wherein the first sensor is positioned on the housing.

109. (Previously presented) The device of claim 106, further comprising a header mounted on the housing, and the first sensor is positioned on the header.

110. (Withdrawn – Previously presented) The device of claim 104,

wherein the cardiac rhythm management device comprises a housing adapted for implantation in the pectoral region of the patient; and

a lead coupled to the housing;

wherein the first sensor is disposed on the lead.

111. (Canceled)

112. (Previously presented) The device of claim 104, wherein the second sensor includes an accelerometer.

113. (Previously presented) The device of claim 104, wherein the second sensor includes a body posture detector.

114. (Previously presented) The device of claim 104, wherein the second sensor is configured to detect a patient activity signal, and wherein the classification system is configured to determine sleep onset by comparing the patient activity signal to a sleep threshold.

115. (Previously presented) The device of claim 114, wherein the classification system is also configured to determine sleep offset by comparing the patient activity signal to the sleep threshold.

116. (Previously presented) The device of claim 104, wherein the classification system is configured to determine REM sleep onset by comparing the pectoral muscle tone to an REM sleep threshold.

117. (Previously presented) The device of claim 116, wherein the classification system is also configured to determine REM sleep offset by comparing the pectoral muscle tone to the REM sleep threshold.

118. (Previously presented) The device of claim 104, wherein the detector system further includes a third sensor configured to detect a cardiac signal, and wherein the therapy system is

configured to provide bradycardia pacing therapy responsive to the detected cardiac signal and to the sleep state classification.

119. (Previously presented) The device of claim 118, wherein the bradycardia pacing therapy is adapted to switch to a lower pacing rate based on the sleep state classification.

120. (Withdrawn) The device of claim 104, wherein the detector system further includes a third sensor configured to detect a cardiac signal, and wherein the therapy system is configured to provide preventative arrhythmia therapy responsive to the detected cardiac signal and to the sleep state classification.

121. (Previously presented) The device of claim 104, wherein the detector system further includes a third sensor configured to detect a cardiac signal, the device further comprising:

an analyzer configured to analyze the cardiac signal on a beat-to-beat basis;

wherein the therapy system is configured to provide therapy based on both the sleep state classification and the beat-to-beat cardiac signal analysis.

122. (Previously presented) The device of claim 104, wherein the detector system further includes a third detector configured to detect a tidal volume of the patient's respiration, and wherein the therapy system is configured to declare a hypopnea event if the tidal volume falls below a hypopnea threshold.

123. (Previously presented) The device of claim 122, wherein the therapy system is also configured to declare an apnea event if the tidal volume falls below an apnea threshold lower than the hypopnea threshold.